IEEE FOUNDATION Focus
September 2004 — ISSUE 9

# The President's Perspective

During the past five years as President of the IEEE Foundation, I have witnessed first hand the positive effects of the many programs it funds, primarily in awards, education, and history.

On 19 June 2004, I represented the IEEE Foundation at the 2004 ***IEEE Honors Ceremony***. There I joined with 300 others in celebrating the engineering achievements of 19 individuals and two corporations. I am pleased to report that four of the awards presented during the ***Ceremony*** were sponsored by the IEEE Foundation: the IEEE Medal of Honor, the IEEE Edison and Founders Medals, and the IEEE Haraden Pratt Award. Some photos from the ***Ceremony*** can be found inside this newsletter.

Among the many educational programs sponsored by the IEEE Foundation was the 2003 and 2004 ***IEEE Computer Society International Design Competition (CSIDC)***. This innovative program encourages learning through hands-on experience by having competing teams, comprised of four undergraduate students, design and implement computer-based solutions to real-world problems. In 2004, 250 teams from 144 schools from around the world participated in the first round of the ***CSIDC***. The top ten teams were invited to compete in the World Finals in Washington, DC, from 25 to 28 June 2004. The winning team received a prize of US$15,000.
To find out who won, look inside.

The IEEE Foundation also devotes a portion of the funds you entrust with us to preserving, studying, and promoting the history of IEEE technologies. In recent years, a large part of this support has been directed toward the award winning ***IEEE Virtual Museum (VM)***. Targeted at educators and young students, the ***VM*** presents web-based exhibits that show how various technologies work and explain how these technologies have shaped the world in which we live. In July 2004, the ***VM*** launched its latest exhibit, ***Let's Get Small: The Shrinking World of Microelectronics***. If you have not already done so, check out the ***IEEE Virtual Museum*** at www.ieee.org/museum.

I hope you are proud of the programs we support and believe, as I do, that the IEEE Foundation is having a positive effect on the profession and society as a whole. Please take a few minutes to read this newsletter and explore the stories we are helping to unfold together.

Regards,

Emerson Pugh

**Emerson Pugh**
IEEE Foundation President

**Emerson Pugh**, IEEE Foundation President, chats with Fern Katronetsky, the new IEEE Foundation Executive Director, during the 2004 IEEE Honors Ceremony held in Kansas City, MO, USA.

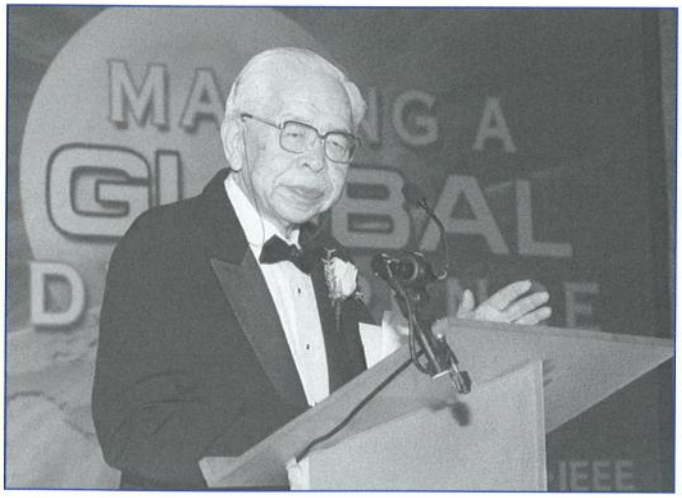
# Making A Global Difference

Nearly 300 people attended the annual IEEE Honors Ceremony held 19 June 2004 in Kansas City, MO, USA. This year's event celebrated 19 individuals and two corporations for their impact on technology, society, and the engineering profession. Their contributions are seen in digital satellite and wireless communications, semiconductor lasers, magnetic recording, programming languages, storm tracking, laser printers, fire-protective clothing and more.


1ST ROW LEFT TO RIGHT:
**James H. McClellan**, ***IEEE Jack S. Kilby Signal Processing Medal***; Dick Pieranunzi on behalf of Pasquale Pistorio, ***IEEE Ernst Weber Engineering Leadership Recognition***; David Atlas, ***IEEE Dennis J. Picard Medal for Radar Technologies and Applications***; Kenneth R. Laker, ***IEEE Richard M. Emberson Award***; Craig R. Barrett, ***IEEE Robert N. Noyce Medal***; Thomas W. Parks, ***IEEE Jack S. Kilby Signal Processing Medal***

2ND ROW LEFT TO RIGHT:
Jerry R. Yeargan, ***IEEE Haraden Pratt Award***; Mildred S. Dresselhaus, ***IEEE Founders Medal***; Arthur W. Winston, IEEE President; Tadahiro Sekimoto, ***IEEE Medal of Honor***; W. Cleon Anderson, IEEE President-Elect; Barbara H. Liskov, ***IEEE John von Neumann Medal***

3RD ROW LEFT TO RIGHT:
Paul R. Gray, ***IEEE James H. Mulligan, Jr. Education Medal***; Federico Capasso, ***IEEE Edison Medal***; Thomas E. Neal, ***IEEE Medal for Engineering Excellence***; Frank Cloutier, ***IEEE Corporate Innovation Recognition – Hewlett-Packard Company***; Jack Keil Wolf, ***IEEE Richard W. Hamming Medal***; Irwin Jacobs, ***IEEE Corporate Innovation Recognition – QUALCOMM Incorporated***; Frederick H. Dill, ***IEEE Jun-ichi Nishizawa Medal***; H. Landis Floyd, II, ***IEEE Medal for Engineering Excellence***; Richard L. Doughty, ***IEEE Medal for Engineering Excellence***



**Tadahiro Sekimoto** accepts the ***2004 IEEE Medal of Honor*** during the 2004 IEEE Honors Ceremony. Dr. Sekimoto received the Medal for contributions to digital satellite communications, promotion of information technology R&D, and technical and corporate leadership in computers and communications. The IEEE Foundation sponsors the ***IEEE Medal of Honor***.

**IEEE President** Arthur W. Winston (left) along with IEEE President-Elect W. Cleon Anderson present Federico Capasso with the ***2004 IEEE Edison Medal*** for a career of highly creative and influential contributions to heterostructure devices and materials. The ***2004 IEEE Edison Medal*** is sponsored in part by the IEEE Foundation.

**IEEE-USA** President John Steadman (left) and IEEE-USA President-Elect Gerard Alphonse (right) take a moment to congratulate the first two women to receive the ***IEEE Founders*** and the ***IEEE John Von Neumann Medals***, Mildred Dresselhaus (second left) and Barbara Liskov (second right), respectively. Dr. Dresselhaus received the ***2004 IEEE Founders Medal***, sponsored by the IEEE Foundation, for leadership across many fields of science and engineering through research and education, and for exceptional and unique contributions to the profession. Dr. Liskov received the ***2004 IEEE John von Neumann Medal***, sponsored by IBM, for fundamental contributions to programming languages, programming methodology, and distributed systems.

**Arthur W. Winston** (left) and W. Cleon Anderson (right) congratulate Jerry R. Yeargan, the recipient of the ***2004 IEEE Haraden Pratt Award***. Dr. Yeargan was recognized for outstanding contributions to the Engineering Accreditation Activities of the IEEE. Sponsored by the IEEE Foundation, the Award is presented for outstanding service to the Institute.

# Brain-Computer Interface Project Wins Scholarship

By: **Lynn Murison**, IEEE Educational Activities

Elena Leah Glassman, a 17-year old high school senior, was awarded the US$10,000 ***IEEE Presidents' Scholarship*** for her Intel International Science and Engineering Fair (ISEF) project entitled "***Brain-Computer Interface for the Muscularly Disabled***." IEEE President-Elect, W. Cleon Anderson, presented the IEEE Foundation supported Scholarship during the Special Awards Ceremony.

> *"why not have a computer anticipate and respond to thought-wavelets rather than training users to a computer's limitations?"*

Elena received the inspiration for her project when she attended a conference at Drexel University where she saw a video showing a man using brain waves to control arm movements by thoughts to implanted electrodes. She thought, "why not have a computer anticipate and respond to thought-wavelets rather than training users to a computer's limitations?" Her hope when she began her quest was to find a way to help people who are paralyzed or suffering from degenerative diseases such as Lou Gehrig's disease.

Her first step was to create an algorithm that interprets electroencephalography (EEG) signals with the highest possible accuracy. In 2003, she successfully achieved 90% accuracy against international researchers using the same public domain EEG datasets to distinguish between right and left movement. Encouraged by this achievement, in 2004 she used herself as the test subject to collect EEG wavelets by placing electrodes on her scalp. Then she spent six months working on her 2003 code. Her new code was able to predict her own right or left movement at 73% accuracy. The difference between the public domain data and data from her own brain illustrated that eventually her software would have to be customized for each user in order to be as effective as she wanted.

Please join us in wishing Elena well as she begins her undergraduate studies at the Massachusetts Institute of Technology in September 2004 where she will major in Electrical Engineering and Computer Science. She hopes to continue working on her project and in other areas of artificial intelligence.

**Elena Leah** Glassman (left) accepts the ***2004 IEEE Presidents' Scholarship*** from IEEE President-Elect W. Cleon Anderson (right) during the Special Awards Ceremony of the ISEF. This well-rounded high-school senior says "science fairs have made the biggest impact on my life, aside from my family. My projects have given me an outlet for my academic energy."

# The 1999 Presidents' Scholarship Graduates and Says Thank You IEEE

Dear IEEE,
Once again, I want to thank you for presenting me with your inaugural Presidents' Scholarship at the Intel ISEF in 1999. It was such an honor to win this generous award from such a prestigious organization.

My family, friends and school were all so happy for me and I received so much publicity (radio, television, newspapers and magazines). Many people that I didn't even know phoned or wrote to congratulate me – even IEEE members, some professors at McMaster University and local engineers were so happy that someone from their own area won.

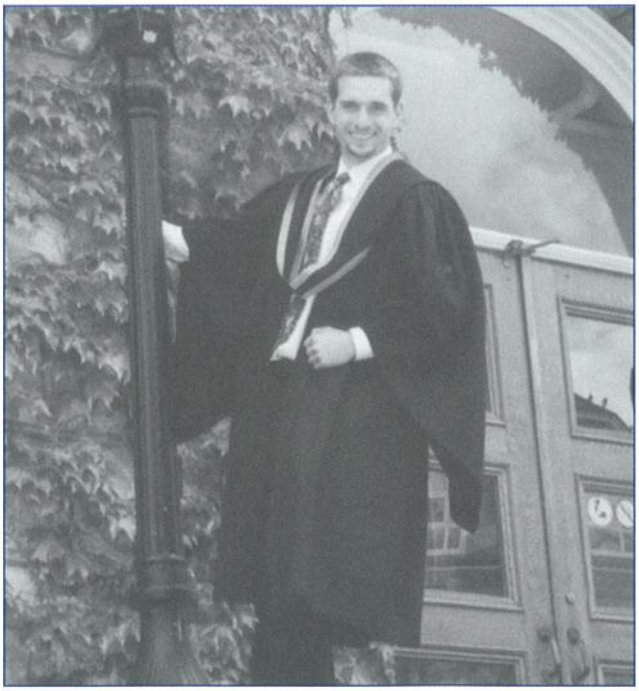
I used my scholarship towards my university tuition. On May 28, 2004, I graduated from Queen's University, Kingston, Ontario, with a Bachelor of Science - Computer Engineering degree.

I am an Engineer! Thanks IEEE!

I will be working in England for a few months. When I return home, I will either go to grad school for my Masters in Engineering or look for challenging work in engineering (possibly robotics or 3D graphics). Whatever I do, I will always remember all that the IEEE has done for me.

Sincerely,

Michael Sweeney Belshaw
1999 IEEE Presidents' Scholarship Recipient



**Michael Sweeney Belshaw,** the ***1999 IEEE Presidents' Scholarship*** recipient, celebrates after his graduation from Queen's University, Kingston, Ontario, Canada. Michael won the US$10,000 Scholarship during the 1999 Intel International Science and Engineering Fair (ISEF) for his project "Robotic Revolution."

# The IEEE Spearheads First International EWeek "New Faces of Engineering" Project

By **Pender M. McCarter**, APR, Fellow PRSA, Director of Communications & Public Relations, IEEE-USA

With the support of the IEEE Foundation, the IEEE spearheaded the first international Engineers Week (EWeek) "New Faces of Engineering" project. "New Faces" included a quarter-page black-and-white advertisement underwritten by the IEEE Foundation, which appeared in the 23 February 2004 *International Herald Tribune (IHT)*. The *IHT* ad featured Dr. Juame Anguera, an IEEE member and electrical engineer from Barcelona, Spain, who is employed in industry and academia.

The ad was planned as part of the overall EWeek "New Faces" program to promote diverse new role models of engineers in and outside of the United States. EWeek is an educational and public-information activity that, through programs such as "New Faces," leads to a greater understanding of engineering and engineers by the informed general public. The *International Herald Tribune* is the world's largest general interest English-language newspaper, with a highly educated and affluent readership of 264,000 in 185 countries.

The IEEE Foundation support for the *IHT* ad helped call attention to the first steps taken to make EWeek a global event and led up to the IEEE's participation in a United Nations non-governmental organization (NGO) briefing on "Girls and Technology: New Educational Opportunities," in which the IEEE was recognized "as the leading NGO in 170 countries advancing the technology skills of girls." Additionally, the "New Faces" project, in combination with other activities launched by IEEE as the lead sponsor for EWeek 2004, helped the organization garner the first international public-relations award for EWeek in a global competition sponsored by the *International Public Relations Association*.

# Winning Design for Communications System Promises Swift Mountain Rescues

By: Stacy Saul, IEEE Computer Society

Ten undergraduate teams from around the world came together in Washington, DC, USA from 25 to 28 June 2004 for the World Finals of the 2004 ***IEEE Computer Society International Design Competition (CSIDC)***. Each team had to solve a real-world problem with a marketable solution using the latest software engineering techniques. At the 28 June 2004 awards ceremony, the judging panel of eleven distinguished computer engineers and scientists announced the top three team winners.

For the second time in the five years of ***CSIDC***, a team from Poznan University of Technology in Poland walked away with the US$15,000 grand prize. Their winning project, "Lifetch", is a GPS-based unit for hikers and other outdoor enthusiasts to carry into areas beyond the reach of ordinary communications. Via an on-board RF transceiver, a Lifetch unit periodically transmits data on position, temperature, acceleration, and light levels to a central monitoring station. The units can also communicate with one another, and eventually the monitoring station itself, via ad hoc networking.

The Politehnica University of Bucharest in Rumania won the second-place prize for its "eXpress! Help", an enhancement to emergency services that uses mobile technology to create a more intuitive method of asking for help and locating those who have requested it. Iowa State University won third place for its "Spatial Cue."

In addition, Honorable Mention awards went to Humboldt University Berlin in Germany; Instituto Militar de Engenharia in Brazil; Lahore University of Management Sciences in Pakistan; National Taiwan University in Taiwan; Tribhuvan University in Nepal; University of Pretoria in South Africa and University of Virginia in the USA.

***CSIDC*** 2004 was made possible by support from the IEEE Foundation, ABB, and Microsoft Corp.

For additional information, including copies of the Finalists' Final Reports and photos, see http://computer.org/csidc

**Two team** members from the Politechnica University of Bucharest in Rumania, Marian Mihailescu (left) and Monica Toma (middle), discuss their project "eXpress!Help" with Judge Marnie Salisbury during the demonstration phase of the competition.

**The Team** from Poznan University of Technology in Poland demonstrates their project, "Lifetch", for two of the CSIDC judges.

FROM LEFT TO RIGHT: Stanislaw Skowronek, Judge Andrew Bernat from the Computing Research Association, Wojciech Jaskowski, Bartosz Nyczkowski, Krzysztof Jedrzejek, and Judge Elizabeth Burd of the University of Durham.

# Encouraging the Future of Spoken Language Processing

Looking for a way to use the royalties from their book "Spoken Language Processing: A Guide to Theory, Algorithm and System Development" to encourage the future of the field, along with matching funds from Microsoft, Drs. Xuedong Huang, Alejandro Acero and Hsiao-Wuen Hon turned to the IEEE Foundation and the IEEE Signal Processing Society. Working cooperatively, the ***Spoken Language Processing Student Grant Program*** was created to recognize students with outstanding papers in the field.

**The field of spoken language processing includes speech production and perception, speech analysis, enhancement, coding, synthesis, recognition, and language modeling.**

Students whose papers in the field of spoken language processing are accepted for publication by either the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) or IEEE Workshop on Automatic Speech Recognition and Understanding (ASRU) are eligible to apply for a ***Grant***. The dollar amounts of the grants vary based on the location of the conference or workshop. The IEEE Signal Processing Society's Speech Technical Committee selects the recipients.

After rigorous evaluation, the first two ***Grants*** were awarded during the *2004 IEEE International Conference on Acoustics, Speech, and Signal Processing – ICASSP 2004* held in Montreal, Quebec, Canada during May 2004. Each student received US$600. Xiang Li of Carnegie Mellon University, Pittsburgh, PA, USA was recognized for his paper "Feature Generation Based on Maximum Normalized Acoustic Likelihood for Improved Speech Recognition" and Luis Perez-Freire of the University of Vigo, Spain was recognized for his paper "A Multimedia Approach for Audio Segmentation in TV Broadcast News."

Both students are pursuing their Ph.D. in fields related to Spoken Language Processing. Each expressed their gratitude to Drs. Huang, Acero, and Hon for providing the funding for the ***Grants***. When asked what the ***Grant*** means to him, Perez-Freire said, "An award like this encourages me to keep on working so I can get my Ph.D." Li said, "The grant will provide me an opportunity to attend ICASSP and meet with the experts in the whole area of spoken language processing, which I believe will greatly benefit my career." Based on these reactions, the benefactors seem to have achieved their goal – to encourage students in the field of spoken language processing.

**Drs. Xuedong Huang**, Hsiao-Wuen Hon and Alejandro Acero take a moment to congratulate Xiang Li and Luis Perez-Freire (LEFT TO RIGHT).

# Dr. Tsuneo Nakahara Appointed Honorary Commander of the Most Excellent Order of the British Empire

The IEEE Foundation is pleased to announce that Dr. Tsuneo Nakahara, a member of the IEEE Foundation Board of Directors, was appointed an Honorary Commander of the Most Excellent Order of the British Empire (CBE). Dr. Nakahara received the appointment in recognition of his contribution to the relations between the United Kingdom and Japan. Established in 1917, the CBE is the third class of the Order of the British Empire, which honors civilians and service personnel for public service or outstanding contribution to society.

Her Britannic Majesty's Ambassador to Japan, **Sir Stephen Gomersall** (right) presented the honor to **Dr. Nakahara** (left) on 2 June 2004 at the British Embassy, Japan.

# IEEE Foundation Sponsors A History Paper Competition For IEEE Student Members

By **Frederik Nebeker**, IEEE History Center

The IEEE 2004 Conference on the History of Electronics marked the one hundredth anniversary of the invention by John Ambrose Fleming of the diode electron-tube, the first of the radio tubes. The conference took place in late June in England's Bletchley Park, the center of British codebreaking during World War II. Over the three days of the conference four dozen papers were presented to some 100 attendees from 20 countries. A valuable part of the conference was the participation, in the form of a poster session and oral presentations, of nine IEEE Student Members from around the world.

These students were the winners of a history paper competition sponsored by the IEEE Foundation. The contest asked students to research some topic in the history of electronics and present their conclusions in a 10- to 20-page paper. From some two dozen papers received, eight papers were designated as Region winners or co-winners. The authors of these papers, along with the author of an outstanding honorable-mention paper, were invited to attend the conference, expenses paid.

The nine students were Asif Islam Khan from Bangladesh (Region 10), Allison Marsh from Maryland, USA (Region 2), Ego Momah from Nigeria (Region 8), Sujoy Mukherjee from West Bengal, India (Region 10), Debo Onifade from Nigeria (Region 8), Sudhir Routray from England (Region 8), Louise St.Germain from Victoria, Canada (Region 7), Michael Tu from Pennsylvania, USA (Region 2), and Lav Varshney from New York, USA (Region 1).

The students attended the entire conference. They presented their research in short oral presentations on the first day of the conference and in a poster session on the second day. Their papers will be published as part of the conference proceedings. In an awards luncheon on the last day of the conference all nine students were honored. Also, three special awards, for presentation at the conference, were announced: Sujoy Mukherjee (first place), Asif Islam Khan (second place), and Michael Tu (third place). The presentations of these students enhanced the conference for everyone, and the experience of the conference gave these young people a greater appreciation for the heritage of the profession they have chosen.

**Student** winners pose for the camera with the contest judges.

FRONT ROW LEFT TO RIGHT: Allison Marsh, Asif Khan, Lav Varshney, Debo Onifade, and Frederik Nebeker (History Center staff).

BACK ROW LEFT TO RIGHT: Louise St. Germain, Wally Read (judge), Michael Tu, John Vardalas (judge), Pilar Molina Gaudo (judge), Sujoy Mukherjee, Ego Momah, and Sudhir Routray.

# Charles Concordia Leaves an Enduring Legacy to the IEEE Foundation —

By: **Karen Galuchie**, IEEE Development Office

Charles Concordia was the engineers' engineer. Some will remember him as the engineer who was responsible for a multitude of technical advances and innovations in the field of power engineering. Others will remember the teacher, the man who took the time to help them break down a complex calculation until it was understood. Still others will remember him for his unwavering commitment to the profession.

It was probably a combination of these qualities and character traits that led Dr. Concordia to invest in the future of the profession by leaving a US$100,000 unrestricted legacy gift to the IEEE Foundation. This legacy gift serves as an enduring testimonial to Dr. Concordia's generosity and commitment to the profession. To show its gratitude, the IEEE Foundation has added Dr. Concordia's name to the roster of the *Goldsmith League*, our legacy giving recognition group.

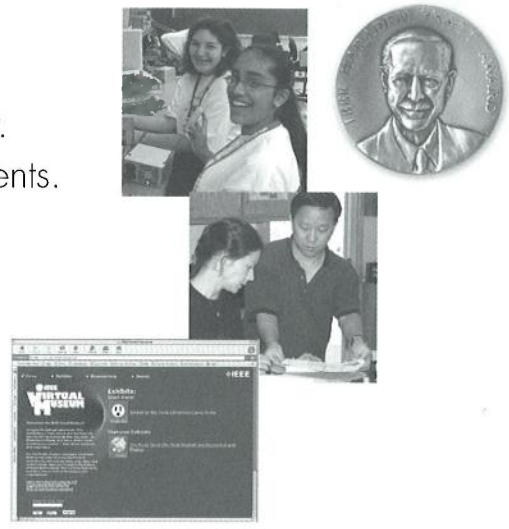
When notified about this gift, IEEE Foundation President Emerson Pugh said, "The IEEE Foundation Board is honored that such a wonderful man and incredibly talented engineer has entrusted us with such a generous gift. This gift is an expression of Dr. Concordia's belief in the importance of our mission of furthering the scientific and educational purposes of the IEEE. We will strive to be worthy of his gift by funding philanthropic activities that will have a significant positive impact on the engineering profession now and well into the future."

To learn more about the IEEE Foundation, the philanthropic arm of the IEEE, visit us on the web at www.ieee.org/foundation. For a confidential discussion on how you can create an enduring legacy and invest in the future of the IEEE Foundation, please contact supportieee@ieee.org.

To view Dr. Concordia's obituary published in June 2004 issue of The Institute, visit
http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=1018&article=tionline/legacy/inst2004/juneo4/6w.obit.xml

# Together We Can Make A Difference

- Inspire students to take an interest in science, technology and engineering.
- Raise the level of teachers' technological literacy.
- Recognize and celebrate engineering achievements.
- Preserve and promulgate the history of IEEE associated technologies.



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